

AMENDMENT UNDER 37 C.F.R. § 1.111
U. S. Application No. 09/489,846

REMARKS

Claims 1-13 are all the claims pending in the application, including new claims 9-13.

The drawings are objected to, because certain designation numbers appearing in the figures do not seem to be present in the specification.

The specification is objected to for failing to conform with requirements of U. S. practice.

Claims 5 and 7 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one of ordinary skill in the art to make and/or use the invention. Claims 1-8 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1-8 also stand rejected under 35 U.S.C. § 102(e) as being anticipated by Evans (US 5,924,074).

Drawings

Applicant herein amends the specification to include the designation numbers P1-P4, to overcome the objection to the drawings.

Specification

Numerous amendments to the specification are included, which overcome the objection to the specification.

Rejection Under 35 U.S.C. § 112, First Paragraph

The Examiner rejects claims 5 and 7 as including a single means element. Regardless of whether the originally filed claims are properly designated as a single means claim or not, the amendments to claims 5 and 7 divide the claim elements more particularly, thereby overcoming the rejection.

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Rejection Under 35 U.S.C. § 112, Second Paragraph

Applicant amends claims 1-8 to improve the structure and language used, as well as correcting antecedent basis problems. Most of the claim amendments are self-explanatory, but Applicant supplements the amendments with the following comments.

Regarding the rejection of claims 2, 4, 6, and 8 based on the use of the phrase “said stored plurality of results,” Applicant submits that the antecedent basis for this phrase is present in the last two lines of amended claim 1.

Thus, Applicant submits that the indefiniteness rejection of claims 1-8 is overcome.

Rejection Under 35 U.S.C. § 102(e)

The present invention relates to a system and method for performing abnormal pattern detection processing of images. In an exemplary embodiment of the present invention shown in FIG. 1, the abnormal pattern detection system 100 includes an image selector means 10, input monitor means 20, abnormal pattern detection processor means 30, a server 40, and evaluator means 50. The quality assurance workstation (QAWS) 410 of FIG. 1 includes the image selector means 10 of the abnormal pattern detection system 100, and the computer-aided image assessment device 420 includes the input monitor means 20, the abnormal pattern detection processor means 30, the server 40, and the evaluator means 50 of the abnormal pattern detection system 100. In the exemplary embodiment, the abnormal pattern detection system detects and processes an abnormal image in an image, based on inputted image information.

Evans relates to an electronic medical records (EMR) system, which automates and simplifies methods of patient chart creation, maintenance and retrieval. Evans’ EMR system

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creates and maintains all patient data electronically and thus can eliminate or supplement creating and maintaining of physical data records. The EMR system finishes healthcare providers with an icon-based interface that enables them to capture and analyze patient data. With this EMR system, healthcare providers enter patient data immediately at the point of care. Also, the EMR system includes the capability to manage a wide variety of patient data formats, including patient data from external sources, such as laboratories and pharmacies. The EMR system of Evans can also incorporate a patient's legacy data, such as a paper chart, into the patient record as well as legacy data from mainframe computers. See col. 2, lines 22-44.

Applicant submits that the Examiner's anticipation rejection of the claims is without merit. Evans does not appear to teach or suggest any of the limitations of claims 1-8. Evans relates to an electronic medical records (EMR) system, in which various medical records are created and maintained. By contrast, the present invention relates to a system and method for performing abnormal pattern detection processing of images. Thus, Evans' system, which manipulates data after it has been collected, is quite different from the present invention.

The Examiner asserts that col. 2, lines 1-4 of Evans discloses that Evans' system aids a physician's detection of abnormal patterns. However, the cited excerpt simply discusses relationships among specific patient data, with abnormal laboratory test results listed as one of the examples of data.

Also, the Examiner asserts that col. 7, lines 33-40, of Evans discloses that a physician can use the EMR system to determine whether abnormalities exist. However, the claims describe processing and relation of a processed image to a corrected result. Assuming, *arguendo*, that the

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cited portion relates to receiving and annotation of an image, there is no relatedness to a corrected result as described in the originally filed claims.

Furthermore, Evans does not appear to teach or suggest any of the limitations of the claims, as amended.

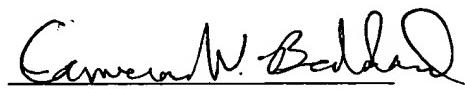
Therefore, Applicant submits that claims 1-8 are allowable over the prior art.

Additionally, new claims 9-13 are added to further define the present invention. These new claims are allowable at least because of their dependence from independent claim 1.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

Paragraph bridging pages 4 and 5:

The present applicant has also proposed an abnormal pattern detection processing system which is well suited for configuring abnormal pattern detection processing as a device independent of the QAWS and constructing a network (Japanese Unexamined Patent Publication No. [10 (1998)-233815]2000-126163). This abnormal pattern detection processing system comprises an image selector means which selects, among the items of image information which are inputted from an image input device equivalent to the above-mentioned image forming modality, being provided with supplementary information which allows identification of the type of subject and the patient[.]. The [the] image information [concerning] concerns a particular type of subject which is to be an object of abnormal pattern detection processing by the abnormal pattern detection processor means[,]. [and] The image selector means outputs the supplementary information. [it, and] The abnormal pattern detection processing system also comprises an input monitor means which, when an item of image information concerning a subject which is to be an object of abnormal pattern detection processing is inputted from the image selector means, monitors that all the other items of image information concerning the same subject for the same patient which are to provide a set with the item of image information concerning the subject which is to be an object are inputted from the image selector means[,]. [and, when] When having detected that all the items of image information have been inputted,

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the input monitor means causes collective inputting of all these items of abnormal pattern detection processing object image information concerning the same subject for the same patient to the abnormal pattern detection processor means. With this configuration, an automatic routing function is provided which, from a number of and a variety of items of image information inputted in the random order, automatically searches out and collects the items of image information which provide a set for each particular patient, thus eliminating the need for manual operation by the operator to select and output the items of image information to be outputted to the abnormal pattern detection processor means.

Paragraph bridging pages 16 and 17:

The abnormal pattern detection processor means may be configured as a device independent of the QAWS or constructed as a device well suited for constructing a network (refer to Japanese Unexamined Patent Publication No. [10 (1998)-233815]2000-126163). Specifically, as stated in Japanese Unexamined Patent Publication No. [10 (1998)-233815]2000-126163), it is recommended that the abnormal pattern detection processing system comprise image selector means which selects, among the items of image information which are inputted from an image input device, being provided with supplementary information which allows identification of the type of subject and the patient[.]. [the] The image information [concerning] concerns a particular type of subject which is to be an object of abnormal pattern detection processing by the abnormal pattern detection processor means[.]. [and] The image selector means outputs the supplementary information. [it, and] The input monitor means which, when an item of image information concerning a subject which is to be an object of abnormal pattern detection processing is inputted from the image selector means, monitors that all the other items

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of image information concerning the same subject for the same patient which are to provide a set with the item of image information concerning the subject which is to be an object are inputted from the image selector means[, and,], [when] When having detected that all the items of image information have been inputted, the input monitoring means causes collective inputting of all these items of abnormal pattern detection processing object image information concerning the same subject for the same patient to the abnormal pattern detection processor means.

Paragraph bridging pages 20 and 21:

To a network 400 as shown in the figure, a CT device, an MRI device, and a CR device[, etc.,] are connected as an image input device 430, and [a] CRTs[, a] and laser printers[, etc.,] are connected as an image output device (image display means) 440. In addition, to this network 400 are connected a QAWS 410 to which all the items of image information inputted to the network 400 from the image input device 430 are inputted and which stores and keeps all these items of image information for collective control; a computer-aided image assessment device 420 which performs a variety of automatic assessments on the basis of the inputted image information; a reporting device to which a pattern reading report representing a comment as a result of reading an image outputted to the image output device 440; and a server (large-capacity hard disk) 40 as memory means which stores the result of detection processing in an abnormal pattern detection system 100 (later described)[, etc.,] and information (a pattern reading report) inputted from the reporting device 450, relating them to each other.

Paragraph bridging pages 26 and 27:

Here, as an output layout of the abnormal patterns detected by the abnormal pattern detection processor means 30 and the original image, a style in which images highlighted,

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enlarged or otherwise processed for the abnormal patterns are display-outputted, and overlaid on part of the entire image is adopted, as shown in FIG. 2A or FIG. 2B. In other words, it provides a layout with which, in the right half of the output screen for the image output device, the original image P for the right side breast and the enlarged views W1 to W4 of the affected part images corresponding to a plurality of abnormal pattern images P1, P11, P21, and P31, respectively, are displayed, while in the left half of the output screen, the original image P' for the left side breast and the abnormal pattern images are displayed (the left half is partly omitted), which is a style in which, as shown in FIG. 2A, the detected abnormal patterns are outputted, being overlaid on part of the entire image P, with the sizes of the enlarged views W1 to W4 of the affected part images being set so that they are all equal to one another, or which is a style in which, as shown in FIG. 2B, the detected abnormal patterns P1 to P4 are outputted, being overlaid on part of the entire image P, with the sizes of the enlarged views W1 to W4 of the affected part images being set so that they correspond to the respective sizes of the detected abnormal patterns P1 to P4.

Paragraph bridging pages 37 and 38:

The input monitor means may be provided with means having a function with which, when, within the previously set time from the moment at which the first item of image information for a particular patient is inputted, the input of all the other items of image information concerning the same subject as that represented by the first item of image information for the patient has not been detected, the input of all the items of image information is regarded as detected[,]. [and only] Only the items of abnormal pattern detection processing object image information which have been inputted are collectively inputted to the abnormal

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pattern detection processor means, so that the likelihood of it never being possible to input the image information which is an object of abnormal pattern detection processing to the abnormal pattern detection processor means, when one or more of the items of image information to provide a set is never inputted for some reason, can be eliminated.

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) An abnormal pattern detection processing method [which, on the basis of inputted image information, detects and processes an abnormal pattern in an image represented by the image information,

wherein, for each of a plurality of items of said image information, the result of said detection processing is related to a corrected result after correcting the result, and stored.]
comprising:

detecting an abnormal pattern in an image, based on inputted image information;
processing the detected abnormal pattern;
correcting the processed abnormal pattern, for each of a plurality of items of the inputted image information;
relating a result of the processed abnormal pattern to a result of the corrected abnormal pattern, for each of the plurality of items of the inputted image information; and
storing the plurality of processed abnormal pattern results and the plurality of corrected abnormal pattern results.

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2. (Amended) An abnormal pattern detection processing method according to claim 1, wherein quantitative evaluation of the [performance of said] detection processing is performed, on the basis of said stored plurality of [results of detection processing] processed abnormal pattern results and said stored plurality of corrected abnormal pattern results.

3. (Amended) An abnormal pattern detection processing method [which, on the basis of inputted image information, detects and processes an abnormal pattern in an image represented by the image information,

wherein, for each of a plurality of items of said image information, the result of said detection processing and the result of pattern reading assessment which has been obtained by pattern reading assessment using said image information are related to the result of pathologic assessment concerning said abnormal pattern, and stored.] comprising:

detecting an abnormal pattern in an image, based on inputted image information;

processing the detected abnormal pattern;

performing a pattern reading assessment using the image information;

performing a pathologic assessment of the abnormal pattern;

relating a result of the detected abnormal pattern processing and a result of the pattern reading assessment to a result of the pathologic assessment, for each of a plurality of items of the inputted image information; and

storing the plurality of processed detected abnormal pattern results, the plurality of pattern reading assessment results and the plurality of pathologic assessment results.

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4. (Amended) An abnormal pattern detection processing method according to claim 3, wherein quantitative evaluation of the [performance of said] pattern reading assessment is performed, on the basis of said stored plurality of [results of] pattern reading assessment results and [results of] said stored plurality of pathologic assessment results.

5. (Amended) An abnormal pattern detection processing system which detects and processes an abnormal pattern in an image represented by [the] image information on the basis of inputted image information, comprising:

a means relating a result of said detection processing to a corrected detection processing result, for each of a plurality of items of said image information; and

memory means [which, for each of a plurality of items of said image information, relates the result of said detection processing to the corrected result after correcting the result, and stores them] storing the plurality of detection processing results and the plurality of corrected detection processing results.

6. (Amended) An abnormal pattern detection processing system according to claim 5, further comprising evaluator means[, which performs] for performing quantitative evaluation of the [performance of said] detection processing on the basis of said plurality of results of detection processing and corrected detection processing results stored in said memory means.

7. (Amended) An abnormal pattern detection processing system, which detects and processes an abnormal pattern in an image represented by [the] image information on the basis of inputted image information, comprising:

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a means relating a result of said detection processing and a result of a pattern reading assessment using said image information to a result of pathologic assessment concerning said abnormal pattern, for each of a plurality of items of said image information; and

memory means [which, for each of a plurality of items of said image information, relates the result of said detection processing and the result of pattern reading assessment which has been obtained by pattern reading assessment using said image information to the result of pathologic assessment concerning said abnormal pattern, and stores them] storing the plurality of detection processing results, the plurality of pattern reading assessment results and the plurality of pathologic assessment results.

8. (Amended) An abnormal pattern detection processing system according to claim 7, further comprising evaluator means[, which performs] for performing a quantitative evaluation of the [performance of said] pattern reading assessment on the basis of said plurality of [results of] pattern reading assessment results and [results of] the plurality of pathologic assessment results stored [on] in said memory means.

Claims 9-13 are added as new claims.